latter after the removal of the compression, and thus perhaps prevent a cure. If the primary clot has extended upwards into the artery, this of course is less likely to happen, but as the surgeon cannot be sure that such extension will take place, it is prudent to act as if it would not. On the other hand, hyper-distension of the sac, as practised by Mr. Heath, seems unnecessary and perhaps even dangerous. The clot is in itself a source of irritation to the wall of the sac, and if this slight irritation is increased by extreme tension it may pass beyond the degree which leads to tissue-production and cause suppuration.

The introduction of needles or of a coagulating injection has been suggested but never yet practised. It might be proper in a second application in those exceptional cases in which the first trial has not caused coagulation, but as it involves a slight risk of suppuration it will probably be thought advisable not to employ it in the first attempt.

Note.—The following is a list of the sources from which the cases above referred to have been obtained :—

Petit, Bulletin gén. de Thérapeutique, 1878, pp. 458, 504, 543. *Weir*, Am. Journ. Med. Sciences, Jan. 7, 1879; N. Y. Med. Journ., vol. xxix. p. 520, and vol. xxxi. p. 637; Archives of Med. (N. Y.), 1880, iii. p. 207. *Gersuny*, Archiv für Klinische Chirurgie, vol. xxiv. p. 798. The Lancet, 1875, ii. p. 448; 1876, ii. pp. 184, 461; 1877, i. p. 571; 1878, i. p. 86; ii. p. 880, and Sept. 28; 1879, ii. pp. 81, 121, 238, 575; 1880, i. p. 289, ii. p. 608. Transactions of Pathological Society, London, vol. xxix. p. 72. Transactions of Clinical Society, London, 1879, vol. xii. p. 55. British Medical Journal, 1880, ii. p. 15. Transactions Med. Soc. Kings Co., N. Y., 1879–80, p. 223. Australian Med. Journ., May, 1879, p. 243. Bryant's Practice of Surgery, 2d Am. ed., p. 324. St. Bartholomew's Hospital Reports, vol. xv. p. 75. Centralblatt für Chirurgie, 1879, vol. vi. p. 65. Bulletins de la Société de Chirurgie, 1880, p. 570.

ARTICLE II.

A RECORD OF THE EPIDEMIC OF BREAK-BONE FEVER IN CHARLESTON, SOUTH CAROLINA, IN 1880. By JOHN FORREST, A.M., M.D., of Charleston, S. C.[1]

THIS report is based upon the answers of twenty-one physicians of Charleston, to a series of questions prepared by the writer, and distributed to the profession in October last. It is necessary to state, that, according to the report of several physicians, a number of cases of break-bone fever occurred in Charleston in the autumn of 1879, some of which were remarkable for the severity of their symptoms. But after a spell of cold weather in November, no more was heard of the disease during the winter. The winter was unusually mild, with scarcely any frost, and the summer was looked forward to with general apprehension, as likely to be a sickly one, especially as there had been extensive excavations made in the streets, for the purpose of laying water pipes, and also for paving, both of which works were continued into very warm weather.

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[1] This paper was read before the Medical Society of South Carolina at the Anniversary meeting Dec. 12, 1880, as the report of the Committee on Epidemics and Meteorology, consisting of Drs. J. Ford Prioleau, T. Grange Simons, and Manning Simons, with which committee the writer was temporarily associated, by a resolution of the Society at a previous meeting.

The following notes of the weather, taken from observations carefully made in the southern part of the city, and beginning from November 1879, properly belong here.

On the 21st of November, 1879, occurred the first and only frost of that winter. The minimum temperature of the month was 30° F. In December the minimum temperature was 34°. The lowest temperature of the earlier part of the year 1880 was in January, 33°, so that we had no frost after the new year.

The mean temperature of the first three months of the year was 58.6°; very mild weather for the season. April was warm, maximum temperature 87°; mean 67°. The next five months were hot. In May the maximum was 89°; mean 73.7°. In June the temperature reached 100°, the maximum for the year; mean 80.6°. In July the mean temperature, 83.4°, was the highest of any month of the year. In August the mean temperature was 81.4°. In September it was 75.8°, and the maximum 89°.

From January to June the rainfall was inconsiderable, averaging for each of the six months 2.48 inches. In May was the least rainfall, 0.90 inch, and the fewest number of rainy days, 4, in the year. In July the rainfall was 5.77 inches. In August there was not much rain, but in the early part of September there was a good deal; so that, preceding the outbreak of the epidemic in July, we had had six months of dry weather.

From February to August, seven months, the prevailing direction of the wind was from the southwest.

There were two thunder-storms on the 2d of June, the first lasted an hour, and the second two hours. On the 14th of the same month there was a third, lasting only a few minutes. In July there were three, on the 5th, 12th, and 23d, of which the first two were very violent. Others occurred on August 6th and September 8th.

During the first four months of the year 1880, there prevailed throughout the city a widespread epidemic of febrile roseola, or, as it was most generally called, the "German measles;" and in the early summer there were a considerable number of cases of remittent, intermittent, and typhoid fevers. But during the epidemic of break-bone fever, no other disease was generally prevalent.

The disease was not recognized as epidemic until the end of July, but cases are reported to have been seen at a much earlier date. One physician reports having been called to his first case on the 13th of March; another in May. Three met with it in June, several in July, but the majority not until August, when it became general all over the city. Towards the end of September it began to decline, but still showed considerable activity in October, many of those who returned to the city in that month being promptly attacked. Cases have also occurred both in November and December, notwithstanding the occurrence of light frosts.

There was no distinction of age, race, or acclimatization among those attacked. Infancy and old age, the white man and the black, native and foreigner, those who had had the yellow fever and those who had not, were equally liable and suffered alike.

The origin of the disease is still involved in obscurity, the reports rather expressing what it is thought not to be, than declaring what it really is. No hint of a foreign origin, or of its having been imported, is thrown out, nor is it thought to be contagious. The opinion is all but unanimous that it is not malarial, in the ordinary acceptation of that term, and it is generally believed to be due to an atmospheric poison derived from as yet unknown sources.

The period of incubation has not been determined with any degree of certainty, and it is variously put down as extending from a few hours to a number of days.

The attack commenced sometimes suddenly, at other times after a varying period of malaise. It was generally ushered in with chilly sensations, or an actual chill, amounting in some cases to a rigor, accompanied by a rise of temperature and most frequently headache, followed by pain in the back and limbs.

The pulse is for the most part described as full and frequent, especially at first; but, after the subsidence of the fever, it became slower even than normal, nor was its frequency as a rule at any time in proportion to the temperature. The number of beats in a minute ranged upwards from 90 to 140, and again sometimes fell below 60, and in one instance to 48. It was often weak and compressible, and sometimes intermitting.

The temperature as a rule was not very high, the thermometer ranging usually from 100° to 104°, but in some instances 105° and 105½° were noted. On the subsidence of the fever the temperature sometimes fell below the normal, as low in one instance as 97°.

According to the majority of the reports the fever, as a rule, showed neither remissions nor intermissions. Doubtless there were oscillations of the thermometer in all cases, and slight differences between the morning and evening temperatures, but it seems to have been most generally a continued fever of a single paroxysm. Yet it is certain that both remissions and intermissions of irregular character occurred in many cases, as testified to by no inconsiderable proportion of observers. Relapses, too, are reported to have been not uncommon, but no regular period could be assigned for their recurrence, and many of these would appear to have been rather recurring paroxysms after remission or intermission than genuine relapses; such, for instance, as are spoken of as occurring "on the second day," or "from a few hours to a day or two." It is also probable that malarial influences impressed their character upon many cases.

The respiration, generally hurried at first, afterwards corresponded with the pulse.

The tongue, generally moist, in many cases broad, thick, and flabby, in others elongated and pointed, was at first clean or coated white, subsequently becoming brown in the middle, the margin and tips remaining clean, or taking on a deep pink or red hue. Sometimes the whole organ was covered with a thick, brown, ill-looking fur. In some cases there was a tendency to dryness, and, in one case, the tongue is described as having been " dry, brown, fissured, and bleeding."

The appetite failed completely in most cases, and no relish was retained for any food whatever, even water being repulsive to the taste. Thirst was not usually much complained of. Digestion was impaired, and remained so in many cases even after convalescence. There was a great deal of nausea in the majority of cases, and frequently vomiting.

The bowels were inclined to be constipated, especially at first, though not unfrequently diarrhœa, in some cases of a dysenteric character, succeeded. Very black stools full of decomposed blood are mentioned in one report as having been not uncommon, and actual hemorrhage from the bowels occurred in some cases.

Pain, which was one of the most constant features of the disease, was complained of in almost every part of the body, now in one place now in another, generally in several places at once. The head, the small of the back, and the lower limbs were most commonly the seat of pain. Headache was mostly frontal and very intense. Other regions mentioned, where pain was complained of, were the joints large and small, the epigastrium extending to both hypochondria, the region of the bladder, the abdominal walls, along the spine, the bowels, the face, and the skin.

Very little swelling was observed anywhere. One report speaks of "slight swelling at the seat of pain, when that was in the joints." Another says it was sometimes seen about the face, particularly the eyes, also on the hands and feet. A third mentions swelling of the parotid and cervical glands in certain cases. In one case, verbally communicated to the writer by the patient (an M.D. and a gentleman distinguished in science), on the invasion of the fever, the hands swelled up and became red and painful, the pain extending up the arms. The symptoms suggested poisoning by poison-plants, but there had been no exposure to such contact. Some cases of orchitis were also verbally reported.

Nervous symptoms were very prominent in most cases from the first. Headache, restlessness, sleeplessness, and mental depression were nearly always present, sometimes there was tremor of the hands, and delirium was not uncommon, especially in children. Three cases of congestion of the brain were reported, two of them fatal.

A symptom present in the great majority of cases was a cutaneous eruption confined to no one region, but found on the face, neck, chest, limbs, palms, etc. It was by no means uniform in character, assuming in different cases the forms of erythema, roseola, sudamina, urticaria, and even of eczema. It was followed by desquamation. The time of its appearance was most frequently on the subsidence of the fever, but sometimes it was coincident with the onset of the disease. It is said sometimes to have been the only symptom seen.

The skin was usually dry at first, but later on profuse sweating was common; and sometimes the disease was ushered in with sweating, which continued throughout.

Hemorrhage from the mucous surfaces was very common. Bleeding at the nose was the most frequent, but it was also observed to take place from the gums, tongue, fauces, pharynx, stomach, and bowels. Pulmonary congestion with bloody sputa is reported in two cases, and dysenteric discharges in several. The catamenia in a number of cases were brought on in advance of the natural period, and the quantity of the discharge was augmented.

Premature labour occurred sometimes, but no case of miscarriage in the early stages of gestation is reported.

The urine was greatly diminished in quantity; in one case the patient, a robust man, passed only eight ounces in the twenty-four hours for the first two days. The reaction was acid, and the specific gravity very high. It became turbid soon after passing, with copious deposit of urates. Albumen was rarely found, and, except in complicated cases, only when the fever continued high for several days.

No single symptom invariably characterized an attack, and, to quote the language of a distinguished physician in his answer to the questions, "there was more than in any other disease great want of uniformity as to mode of invasion, severity of disease, character of symptoms, duration of attack, etc. etc. Prognosis as to ultimate favourable termination was about all one could venture to predict."

The following sequelæ were observed: excessive and obstinate prostration nearly always, sleeplessness very commonly, night sweats, anæmia, hysteria, neuralgia, diarrhœa, boils and carbuncles, conjunctivitis, bronchial catarrh, deafness, aphonia, œdema, icterus, cystitis, rheumatism, and temporary paralysis of the lower limbs.

The treatment generally adopted was symptomatic, and consisted in the use of mild cathartics, diaphoretics, anodynes, arterial and nervous sedatives, sinapisms, stimulants, and tonics, *pro re natâ*. Quinia was used as a febrifuge and tonic, but is not reported to have exercised a specific influence over the disease either prophylactic or curative.

Of 2015 patients treated, 7 died, but of these more than one-half died from the disease under which they were previously labouring. The record is as follows: died of epilepsy, 1; syphilis, 1; hip-joint disease, 1; *convulsions*, 1; *congestion of the brain*, 2; *cerebral embolism*, 1. In the last four cases death was probably due either to the severity of the disease itself, or to the consequent prostration.

To estimate accurately the number of cases that have occurred in the city would be very difficult, as by far the majority of those attacked availed themselves only of domestic therapeutics without employing any physician. We have, however, obtained from forty-one physicians the number of cases each attended, the total amount being 4036. As there are between fifty and sixty practitioners of medicine in Charleston it is safe to estimate the number of cases treated at upwards of 5000; and if, as is generally allowed, not more than one-third of the sick received professional attention, there must have been more than 15,000 cases of the disease.

Outside of Charleston the disease prevailed at Mount Pleasant, Sullivan's Island, Summerville, Beaufort, Port Royal, Columbia, and Aiken, according to reports received; and it is said to have occurred at other places from which we have had no word.

In making a general comparison of this with previous epidemics, we find somewhat similar meteorological conditions, as, great heat, want of rain, absence of thunder-storms, and prevailing southwest wind. The symptoms of the disease in this epidemic, however, do not appear to have been generally so violent and distressing as in some former ones, nor was the epidemic so nearly universal.

In conclusion, I beg to return my thanks to the other members of the Committee on Epidemics and Meteorology of the Medical Society of South Carolina for their kind and valuable assistance; also to Mr. John Grover, of the U. S. Signal Corps, to whose kindness I am indebted for the information on the weather; and lastly, and in an especial manner, to those gentlemen of the profession in Charleston and throughout the State, who have so politely troubled themselves to answer the questions propounded, and have evinced in personal conference and by letter so much interest in furthering my object, which was simply to place upon the minutes of the Medical Society of South Carolina a record of an epidemic so remarkable for its wide-spread character, the severity of its symptoms and a minimum of mortality.